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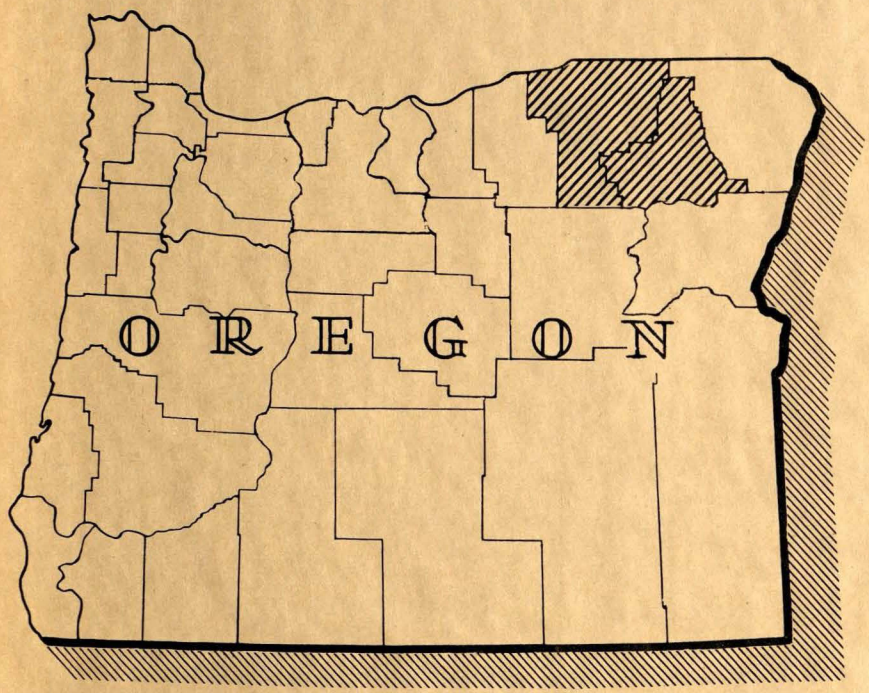
FOREST SURVEY REPORT 135
APRIL 1960

FOREST STATISTICS *for* UMATILLA *and* UNION COUNTIES, OREGON



PACIFIC NORTHWEST
FOREST AND RANGE EXPERIMENT STATION
U. S. DEPT. OF AGRICULTURE • FOREST SERVICE

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Forest Survey Report 135

FOREST STATISTICS

FOR

UMATILLA AND UNION COUNTIES, OREGON

by

Colin D. MacLean
and
Wayne Orr

April 1960

PACIFIC NORTHWEST
FOREST AND RANGE EXPERIMENT STATION
R. W. Cowlin, Director Portland, Oregon

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

PREFACE

This publication summarizes the results of a 1957 and 1958 reinventory of the forests of Umatilla and Union Counties, Oreg. The reinventory is a part of the maintenance phase of the Forest Survey, a nationwide project of the Forest Service authorized by the McSweeney-McNary Forest Research Act of 1928, amended June 25, 1949. The purpose of the Forest Survey is to periodically inventory the extent and condition of forest lands and the timber and other products on them to ascertain rates of forest growth and depletion, to estimate present consumption of timber products and determine probable future trends in timber requirements, to analyze and make available survey information needed in the formulation of forest policies and programs, and to make resurveys as necessary to keep the basic information up to date.

The Forest Survey is conducted in the various forest regions of the Nation by the regional experiment stations of the Forest Service. In the Pacific Northwest region of Oregon and Washington, it is an activity of the Pacific Northwest Forest and Range Experiment Station at Portland, Oreg.

The initial inventory of forest lands in Umatilla and Union Counties took place in 1936. In 1937 the inventory data were adjusted to current conditions, and the next year the Station released forest type maps of both counties (1-inch-to-the-mile scale) and separate statistical reports, "Forest Statistics for Umatilla County, Oregon" and "Forest Statistics for Union County, Oregon."

Following the reinventory in 1957-58, the forest type maps have again been revised and are available on scales of 1 and 2 inches to the mile. A single 1-inch-scale map was prepared for each county; the 2-inch-scale maps were prepared in sections (see index map, inside rear cover). Any of these maps may be obtained at cost of blueprinting. For information write Director, Pacific Northwest Forest and Range Experiment Station, P.O. Box 4059, Portland 8, Oreg.

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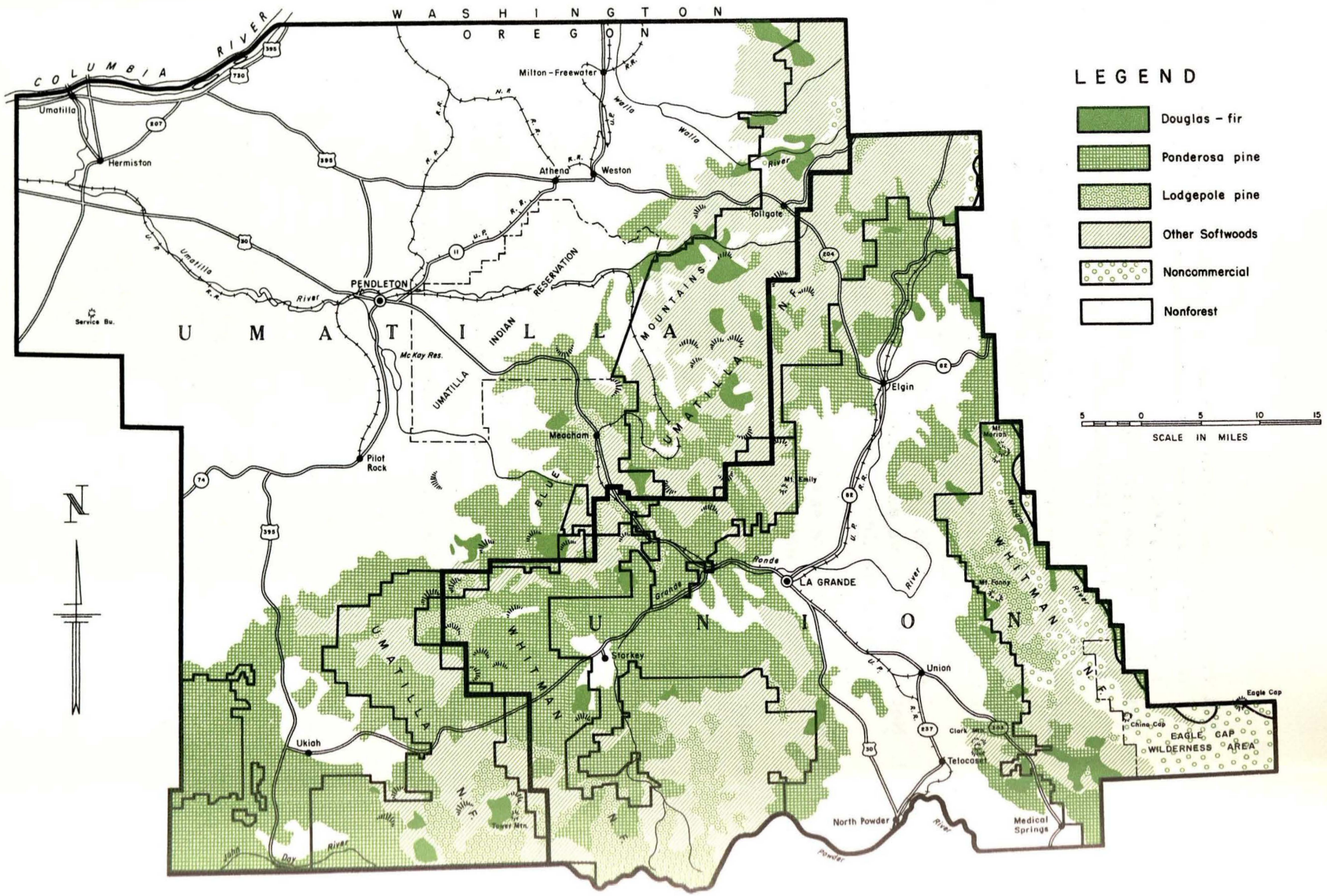
GENERALIZED FOREST TYPE MAP

UMATILLA AND UNION COUNTIES, OREGON – 1958



DESCRIPTION OF THE COUNTIES

Umatilla and Union Counties are situated in northeastern Oregon. Umatilla County extends 70 miles south from the Oregon-Washington boundary and 25 to 65 miles west from the crest of the Blue Mountains. Union County, lying immediately to the east, extends from Grant and Baker Counties 60 miles northward to within 1,0 miles of the Oregon-Washington boundary. The Minam River and a spur of the Wallowa Mountains outline the east boundary and separate Union from Wallowa County.

Umatilla County is drained by the Umatilla, Walla Walla, and John Day Rivers. In Union County, 85 percent of the land lies in the Grande Ronde River watershed; the southernmost 15 percent is drained by tributaries of the Powder River.

The topography of the two-county area is varied, ranging from the level plains of northwestern Umatilla County to the rugged Wallowa Mountains of eastern Union County. Between these extremes lie the less rugged Blue Mountains, found in both counties, and the 2,800-foot-high upland plateau of central Union County. Elevations range from 300 feet in the lowlands of northwestern Umatilla County to 9,675 feet at the summit of Eagle Cap in the Wallowa Mountains. The crest of the Blue Mountains averages about 5,000 feet in elevation.

Climate in the two-county area varies with elevation; the lower areas are warmer and drier than the mountainous sections. Annual rainfall ranges from less than 10 inches in the Columbia River valley to more than 30 inches in the higher mountains. Seasonal temperature fluctuates greatly, with temperatures ranging from subzero to more than 100 degrees.

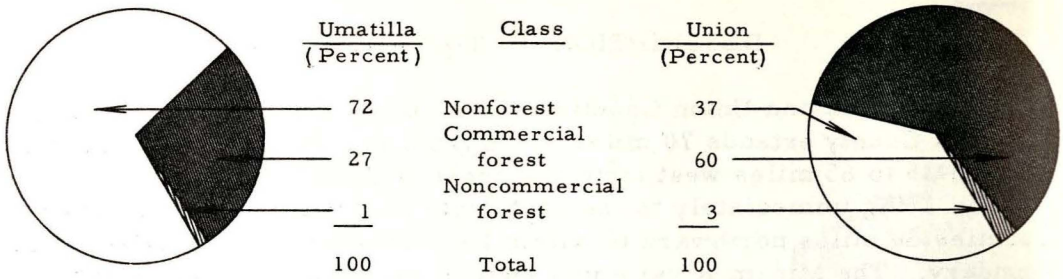
Federal Highways 30, 395, and 730, together with State, county, and Forest Service roads, provide easy access to most areas in the two counties. The main line and branch lines of the Union Pacific Railroad service the more heavily populated parts of both counties.

The population of Umatilla County was at 41,703 in 1950, with 28 percent living in Pendleton, its largest city. Union County had 17,962 persons, with 48 percent living in La Grande.

SIGNIFICANT FINDINGS IN THE FOREST INVENTORY

Land Classification

Slightly more than a quarter of Umatilla County (589,000 acres) and almost two-thirds of Union County (822,000 acres) is forest land. Farmlands and urban areas account for almost all of the remaining area.



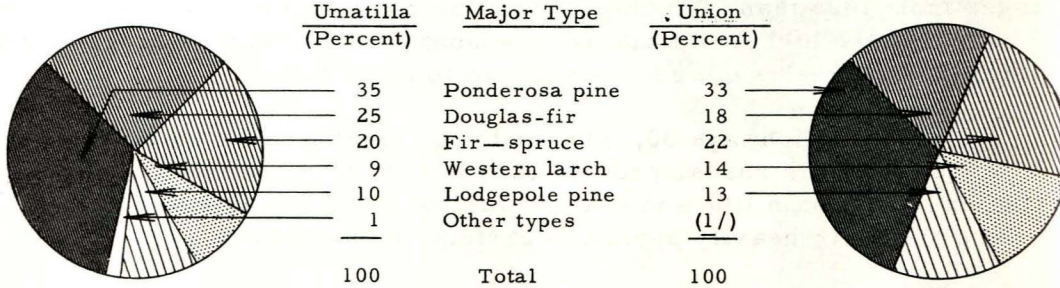
Umatilla (Percent)	Class	Union (Percent)
72	Nonforest	37
27	Commercial forest	60
1	Noncommercial forest	3
100	Total	100

Only about 2 percent of the total area of the two counties is noncommercial forest land. Three-fourths of this is unproductive, consisting of noncommercial-rocky, subalpine, and juniper areas. The remainder is classified as productive-reserved land. Several State parks and the Eagle Cap Wilderness Area, all set aside for recreational purposes, account for the productive-reserved land.

Commercial Forest Land Area

Major Types

The forests of the two counties are almost exclusively softwoods, with small stringers of hardwoods in the river valleys. Ponderosa pine predominates in the forested areas and often occurs in pure stands at lower elevations.



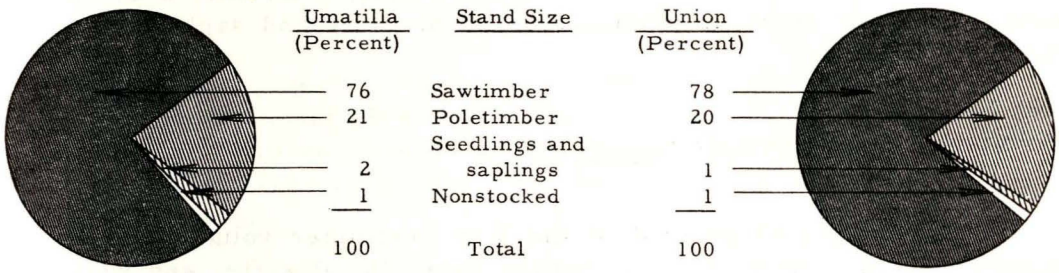
Umatilla (Percent)	Major Type	Union (Percent)
35	Ponderosa pine	33
25	Douglas-fir	18
20	Fir—spruce	22
9	Western larch	14
10	Lodgepole pine	13
1	Other types	(1/)
100	Total	100

1/ Less than 0.5 percent.

As elevation increases, other species--Douglas-fir, white fir, western larch, and lodgepole pine--are found in increasing proportions. On the cool, moist, upper slopes, these species give way to subalpine fir and Engelmann spruce. Extensive pure stands of lodgepole pine are often found at higher elevations where fire, insects, or disease killed the original stand.

Stand-Size Classes

Sawtimber stands occupy slightly more than three-quarters of the commercial forest land of both counties. Large sawtimber (21.0 inches d.b.h. and larger) stands make up slightly less than half of this. A third of the sawtimber area is in ponderosa pine types, and most of the remaining acreage is divided between Douglas-fir, true firs, spruce, and western larch.



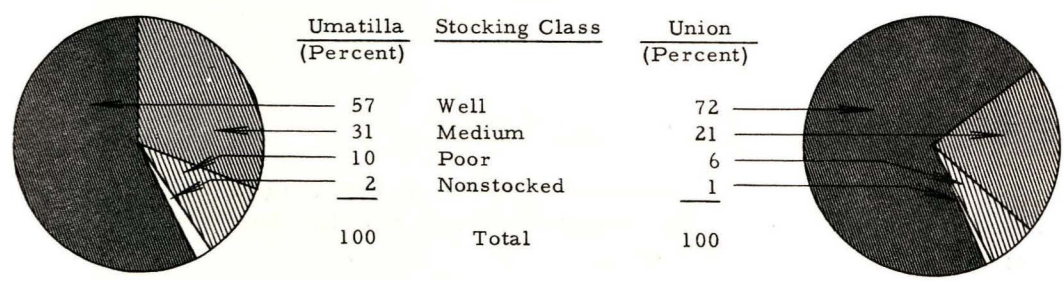
Umatilla (Percent)	Stand Size	Union (Percent)
76	Sawtimber	78
21	Poletimber	20
2	Seedlings and saplings	1
1	Nonstocked	1
100	Total	100

Poletimber stands occupy about one-fifth of the commercial forest land in both counties. Repeated fires have aided in establishment of the lodgepole pine stands that now occupy 38 percent of the two counties' poletimber acreage. An additional 30 percent, mostly cutover lands, are stocked with ponderosa pine. Douglas-fir, western larch, and fir-spruce account for most of the remaining poletimber acreage.

Seedling and sapling stands occupy only about 2 percent of the commercial forest land in the two counties. About 1 percent is nonstocked.

Stocking of Young-Growth Stands

Most of the young-growth stands in the two counties are satisfactorily stocked (40-100 percent stocked); only 8 percent are poorly stocked. (Young-growth stands are those in which the majority of the cubic-foot volume is in trees less than 21.0 inches d.b.h.)



Umatilla (Percent)	Stocking Class	Union (Percent)
57	Well	72
31	Medium	21
10	Poor	6
2	Nonstocked	1
100	Total	100

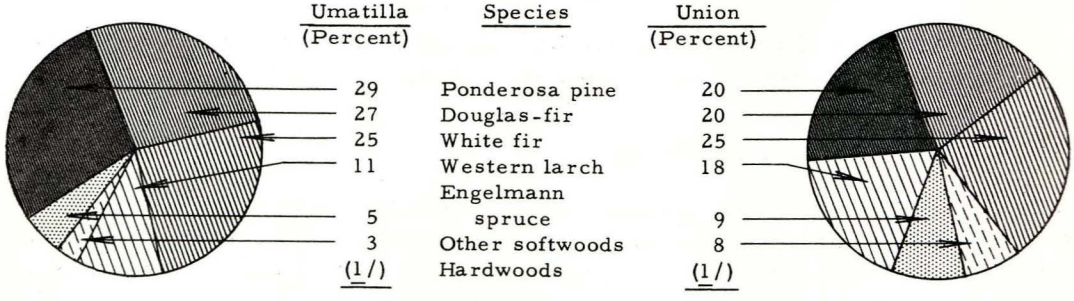
Poorly stocked young-growth stands and nonstocked areas comprise 6 percent of the total commercial forest land in the two counties.

Commercial Forest Land Timber Volumes

The net volume of live, sound sawtimber trees (11.0 inches d.b.h. and larger) on commercial forest land in Umatilla and Union Counties is estimated to be 10,464 million board feet, Scribner rule. Nearly all this volume is in sawtimber stands, with only 2 percent in sawtimber-size trees in poletimber and seedling and sapling stands and nonstocked areas.

Volume of Sawtimber by Species

More than 99 percent of the live sawtimber volume in the two counties is in softwoods. Ponderosa pine, Douglas-fir, and white fir together account for almost three-quarters of the total sawtimber volume. An additional one-fifth is in western larch and Engelmann spruce. The remaining volume is distributed mainly among the following species: lodgepole pine, subalpine fir, western white pine, whitebark pine, mountain hemlock, black cottonwood, northwestern paper birch, and quaking aspen.

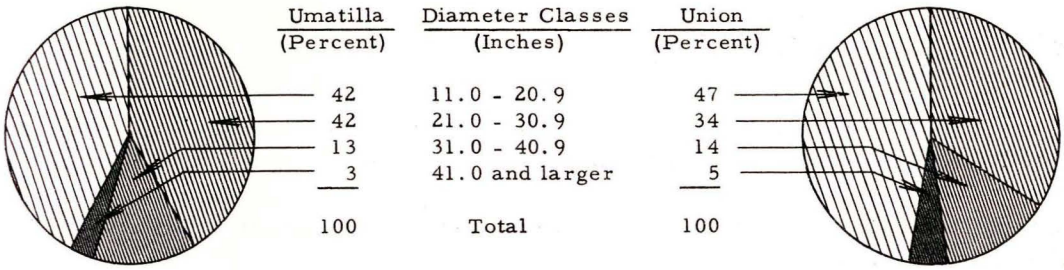


Umatilla (Percent)	Species	Union (Percent)
29	Ponderosa pine	20
27	Douglas-fir	20
25	White fir	25
11	Western larch	18
5	Engelmann spruce	9
3	Other softwoods	8
(1/)	Hardwoods	(1/)
100	Total	100

1/ Less than 0.5 percent.

Volume of Sawtimber by Diameter Classes

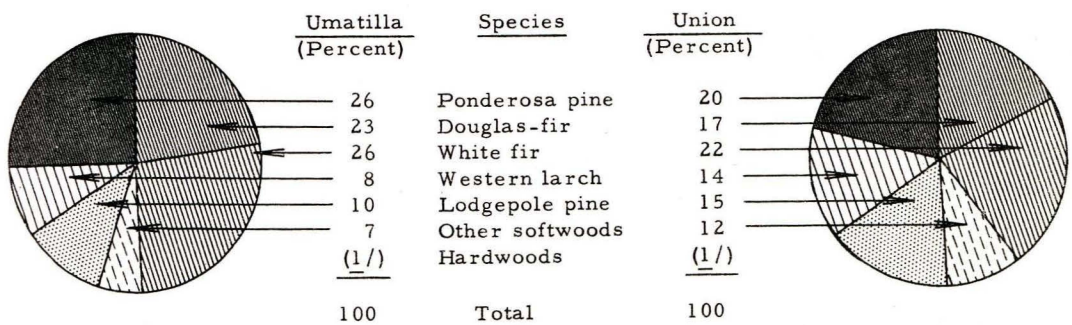
Four-fifths of the sawtimber volume in Umatilla and Union Counties occurs in trees between 11.0 and 30.9 inches d.b.h., with almost one-half of this in trees over 20.9 inches.



Ponderosa pine and white fir are more commonly found in the larger diameter classes than other species. Sixty-four percent of the volume of these two species is in trees over 20.9 inches d.b.h. Only 47 percent of the volume of the other species in the two counties falls in this size class.

Volume of Growing Stock by Species

Growing-stock volume is the cubic-foot volume of all live, sound trees 5.0 inches d.b.h. and larger to a minimum 4-inch top inside bark.



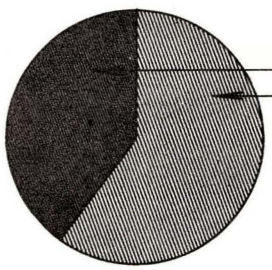
1/ Less than 0.5 percent.

Of the growing stock in the two counties, 74 percent is in sawtimber trees and 26 percent in poletimber trees.

Forest Ownership

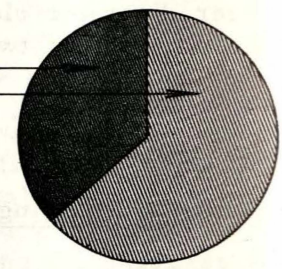
Commercial Forest Land

Thirty-seven percent of the commercial forest land of both counties is in private ownership, and less than 1 percent is divided between State, county, and municipal holdings. The remainder, amounting to about 62 percent of the total commercial forest land, is federally owned or administered.



Umatilla (Percent)	Ownership Class	Union (Percent)
40	Private	36
60	Federal	64
(1/)	Other public	(1/)
100	Total	100

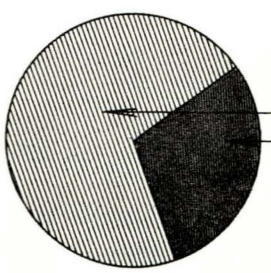
1/ Less than 0.5 percent.



All but 4 percent of the Federal area is in the Umatilla and Wallowa-Whitman National Forests; the other Federal lands are administered by the Bureau of Indian Affairs and the Bureau of Land Management.

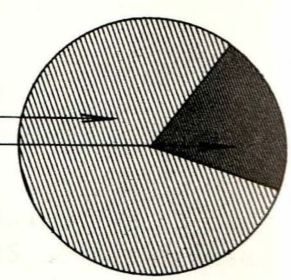
Sawtimber Volume

Approximately three-quarters of the total sawtimber volume is federally owned. Most of the remaining sawtimber volume is on private lands, with only three-tenths of 1 percent on State, county, and municipal lands.



Umatilla (Percent)	Ownership Class	Union (Percent)
70	Federal	79
30	Private	21
(1/)	Other public	(1/)
100	Total	100

1/ Less than 0.5 percent.



Log Production

In 1958, total log production in Umatilla and Union Counties was 191 million board feet, Scribner rule. During the past 10 years, annual log production has ranged from 33 million board feet in 1949 to 203 million in 1957. Log production for these years was as follows:[1/]

	Umatilla County (M b.m.)	Union County (M b.m.)
1949	10,553	22,919
1950	53,566	39,365
1951	60,910	38,005
1952	40,533	48,548
1953	63,571	48,273
1954	101,868	64,925
1955	78,653	58,107
1956	78,026	89,228
1957	82,026	120,638
1958	92,494	98,479

The marked increase in production during the past 10 years is a result of the stepped-up timber harvesting program on both national-forest and private lands. The national forests' share of the two counties' log production ranged from 6 percent in 1953 to 31 percent in 1958.

[1/] Does not include volume removed for poles, piling, or products from woodcutting operations.

Table 1.--Land area in Umatilla County, by major class of land, 1958

Class of land	Area
	Acres
Forest:	
Commercial	562,650
Noncommercial:	
Productive-reserved	4,670
Unproductive	21,590
Total forest	588,910
Nonforest	1,478,930
All classes	2,067,840

Table 2.--Land area in Union County, by major class of land, 1958

Class of land	Area
	Acres
Forest:	
Commercial	778,630
Noncommercial:	
Productive-reserved	10,050
Unproductive	33,340
Total forest	822,020
Nonforest	477,480
All classes	1,299,500

Table 3.--Area of commercial forest land in Umatilla County, by ownership and stand-size classes, 1958

(In acres)

Ownership class	Total	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Nonstocked areas
Private	223,340	156,700	56,250	8,720	1,670
State	1,910	1,330	380	70	130
County	60	60	--	--	--
Municipal	190	150	40	--	--
Federally owned or administered:					
Indian	20,180	18,630	1,500	30	20
Bureau of Land Mgt.	3,340	2,510	720	110	--
National forest	313,630	248,900	56,270	3,680	4,780
Total Federal	337,150	270,040	58,490	3,820	4,800
All ownerships	562,650	428,280	115,160	12,610	6,600

Table 4.--Area of commercial forest land in Union County, by ownership and stand-size classes, 1958

(In acres)

Ownership class	Total	Sawtimber stands	Poletimber stands	Seedling and sapling stands	Nonstocked areas
Private	277,050	209,140	64,450	3,060	400
State	1,450	1,180	240	30	--
County	1,820	1,350	430	40	--
Federally owned or administered:					
Indian	1,660	1,590	60	10	--
Bureau of Land Mgt.	4,140	3,100	900	140	--
National forest	492,510	393,260	87,340	6,100	5,810
Total Federal	498,310	397,950	88,300	6,250	5,810
All ownerships	778,630	609,620	153,420	9,380	6,210

Table 5.--Area of commercial forest land in Umatilla County, by major forest type and stand-size class, 1958

(In acres)

Forest type	Total	Sawtimber stands		Poletimber stands	Seedling and sapling stands	Nonstocked areas
		Large[1/]	Small[2/]			
Ponderosa pine	196,060	93,770	60,300	37,090	4,900	--
Lodgepole pine	52,810	--	10,590	37,090	5,130	--
Douglas-fir	138,320	47,000	68,160	21,610	1,550	--
Western larch	51,790	11,590	30,840	8,460	900	--
Fir—spruce	113,470	46,980	55,880	10,480	130	--
Hardwood	3,600	270	2,900	430	--	--
Nonstocked	6,600	--	--	--	--	6,600
Total	562,650	199,610	228,670	115,160	12,610	6,600

[1/] 21.0 inches d.b.h. and larger.

[2/] 11.0-20.9 inches d.b.h.

Table 6.--Area of commercial forest land in Union County, by major forest type and stand-size class, 1958

(In acres)

Forest type	Total	Sawtimber stands		Poletimber stands	Seedling and sapling stands	Nonstocked areas
		Large[1/]	Small[2/]			
Ponderosa pine	253,180	94,770	111,670	44,500	2,240	--
Western white pine	720	710	--	10	--	--
Lodgepole pine	102,040	--	32,790	63,930	5,320	--
Douglas-fir	137,690	57,830	60,140	18,820	900	--
Western larch	109,320	36,390	55,780	16,390	760	--
Fir—spruce	168,500	78,790	80,010	9,590	110	--
Hardwood	970	140	600	180	50	--
Nonstocked	6,210	--	--	--	--	6,210
Total	778,630	268,630	340,990	153,420	9,380	6,210

[1/] 21.0 inches d.b.h. and larger.

[2/] 11.0-20.9 inches d.b.h.

Table 7.--Land area in Umatilla County, by cover

(In

	Cover type or land class	Total unreserved and reserved
		PRODUCTIVE
		Total
1	Ponderosa pine, large sawtimber	96,230
2	Ponderosa pine, small sawtimber	60,510
3	Ponderosa pine, poletimber	37,130
4	Ponderosa pine, seedlings and saplings	4,900
5	Lodgepole pine, small sawtimber	10,590
6	Lodgepole pine, poletimber	37,210
7	Lodgepole pine, seedlings and saplings	5,130
8	Douglas-fir, large sawtimber	47,390
9	Douglas-fir, small sawtimber	68,590
10	Douglas-fir, poletimber	21,720
11	Douglas-fir, seedlings and saplings	1,550
12	Western larch, large sawtimber	11,590
13	Western larch, small sawtimber	30,870
14	Western larch, poletimber	8,500
15	Western larch, seedlings and saplings	900
16	White fir,[1] large sawtimber	41,980
17	White fir, small sawtimber	46,120
18	White fir, poletimber	9,720
19	White fir, seedlings and saplings	80
20	True fir—mountain hemlock, large sawtimber	2,860
21	True fir—mountain hemlock, small sawtimber	2,990
22	True fir—mountain hemlock, poletimber	820
23	Engelmann spruce, large sawtimber	2,590
24	Engelmann spruce, small sawtimber	7,100
25	Engelmann spruce, seedlings and saplings	50
26	Hardwoods, large sawtimber	270
27	Hardwoods, small sawtimber	2,900
28	Hardwoods, poletimber	430
29	Nonstocked area	6,600
30	Total	567,320
31	Noncommercial, rocky	NONCOMMERCIAL
32	Juniper	21,390
33	Total	200
		21,590
34	Vegetative land (cultivated, grass, or brush)	NONFOREST
35	Nonvegetative land (including barrens and cities)	. . . . .
36	Unmeandered water (reservoirs)	. . . . .
37	Total[3]	. . . . .
		1,478,930
	Forest land:	ALL
38	Commercial	562,650
39	Noncommercial (productive-reserved and unproductive)	26,260
40	Total forest land	588,910
41	Nonforest land	1,478,930
42	Total, all land[3]	[4]2,067,840

[1] See list of tree species, page 43.

[2] No breakdown on nonforested national-forest land.

[3] Except for national-forest land, unreserved nonforest land is unclassified as to ownership and type.

[4] Bureau of Census figure (1950).

type, ownership class, and land-use class, 1958

acres)

Unreserved								Reserved			
					Federally owned or administered						
Total	Private	State	County	Municipal	Indian	Bureau of Land Mgt.	National forest	Total	State	Municipal	
FOREST LAND											
Commercial								Noncommercial (productive-reserved)			
93,770	42,330	560	30	--	8,820	1,010	41,020	2,460	2,460	--	1
60,300	34,300	290	30	--	3,480	250	21,950	210	210	--	2
37,090	25,440	80	--	--	570	160	10,840	40	40	--	3
4,900	4,800	--	--	--	10	90	--	--	--	--	4
10,590	400	--	--	--	20	30	10,140	--	--	--	5
37,090	8,470	210	--	--	330	400	27,680	120	120	--	6
5,130	1,400	30	--	--	20	--	3,680	--	--	--	7
47,000	14,400	70	--	10	1,230	320	30,970	390	290	100	8
68,160	27,100	240	--	130	2,670	310	37,710	430	430	--	9
21,610	11,150	90	--	20	290	160	9,900	110	110	--	10
1,550	1,510	40	--	--	--	--	--	--	--	--	11
11,590	1,890	20	--	--	110	40	9,530	--	--	--	12
30,840	6,780	--	--	--	610	390	23,060	30	--	30	13
8,460	5,230	--	--	--	120	--	3,110	40	10	30	14
900	880	--	--	--	--	20	--	--	--	--	15
41,530	10,830	40	--	10	210	150	30,290	450	10	440	16
45,810	14,990	100	--	--	230	10	30,480	310	280	30	17
9,660	5,500	--	--	--	30	--	4,130	60	50	10	18
80	80	--	--	--	--	--	--	--	--	--	19
2,860	--	--	--	--	--	--	2,860	--	--	--	20
2,990	120	--	--	--	--	--	2,870	--	--	--	21
820	210	--	--	--	--	--	610	--	--	--	22
2,590	300	--	--	--	--	--	2,290	--	--	--	23
7,080	1,340	10	--	--	--	--	5,730	20	20	--	24
50	50	--	--	--	--	--	--	--	--	--	25
270	180	--	--	--	90	--	--	--	--	--	26
2,900	1,740	--	--	--	1,160	--	--	--	--	--	27
430	250	--	--	20	160	--	--	--	--	--	28
6,600	1,670	130	--	--	20	--	4,780	--	--	--	29
562,650	223,340	1,910	60	190	20,180	3,340	313,630	4,670	4,030	640	30
UNPRODUCTIVE FOREST LAND											
21,150	3,830	--	--	--	--	120	17,200	240	240	--	31
180	180	--	--	--	--	--	--	20	20	--	32
21,330	4,010	--	--	--	--	120	17,200	260	260	--	33
LAND											
. . . . .							)	530	530	--	34
. . . . .							2/70,470)	340	340	--	35
. . . . .							)	--	--	--	36
1,478,060							70,470	870	870	--	37
LAND											
562,650	223,340	1,910	60	190	20,180	3,340	313,630	--	--	--	38
21,330	4,010	--	--	--	--	120	17,200	4,930	4,290	640	39
583,980	227,350	1,910	60	190	20,180	3,460	330,830	4,930	4,290	640	40
1,478,060							70,470	870	870	--	41
2,062,040							401,300	5,800	5,160	640	42

Table 8.--Land area in Union County, by cover

(In

	Cover type or land class	Total unreserved and reserved
		PRODUCTIVE
		Total
1	Ponderosa pine, large sawtimber	95,410
2	Ponderosa pine, small sawtimber	111,790
3	Ponderosa pine, poletimber	44,500
4	Ponderosa pine, seedlings and saplings	2,240
5	Western white pine, large sawtimber	710
6	Western white pine, poletimber	10
7	Lodgepole pine, small sawtimber	32,790
8	Lodgepole pine, poletimber	65,450
9	Lodgepole pine, seedlings and saplings	5,320
10	Douglas-fir, small old-growth and large young-growth sawtimber (red fir)	57,870
11	Douglas-fir, small sawtimber	60,180
12	Douglas-fir, poletimber	18,830
13	Douglas-fir, seedlings and saplings	900
14	Western larch, large sawtimber	36,700
15	Western larch, small sawtimber	60,260
16	Western larch, poletimber	16,840
17	Western larch, seedlings and saplings	760
18	White fir,[1/] large sawtimber	70,040
19	White fir, small sawtimber	47,320
20	White fir, poletimber	7,560
21	White fir, seedlings and saplings	80
22	True fir—mountain hemlock, large sawtimber	2,500
23	True fir—mountain hemlock, small sawtimber	20,900
24	True fir—mountain hemlock, poletimber	1,530
25	True fir—mountain hemlock, seedlings and saplings	30
26	Engelmann spruce, large sawtimber	6,280
27	Engelmann spruce, small sawtimber	14,080
28	Engelmann spruce, poletimber	620
29	Hardwoods, large sawtimber	140
30	Hardwoods, small sawtimber	600
31	Hardwoods, poletimber	180
32	Hardwoods, seedlings and saplings	50
33	Nonstocked area	6,210
34	Total	788,680
		NONCOMMERCIAL
35	Subalpine	8,300
36	Noncommercial, rocky	25,030
37	Juniper	10
38	Total	33,340
		NONFOREST
39	Vegetative land (cultivated, grass, or brush)	439,560
40	Nonvegetative land (including barrens and cities)	36,660
41	Unmeandered water (reservoirs)	1,260
42	Total	477,480
		ALL
	Forest land:	
43	Commercial	778,630
44	Noncommercial (productive-reserved and unproductive)	43,390
45	Total forest land	822,020
46	Nonforest land	477,480
47	Total, all land	1,299,500

[1/] See list of tree species, page 43.

type, ownership class, and land-use class, 1958

acres)

Total	Unreserved: Private	State	County	Federally owned or administered: Indian	Bureau of Land Mgt.	National forest	Reserved: Total	State	Federal (national forest)	
FOREST LAND										
	Commercial						Noncommercial (productive-reserved)			
94,770	33,510	300	370	970	740	58,880	640	310	330	1
111,670	81,820	200	200	60	210	29,180	120	120	--	2
44,500	26,120	90	140	--	230	17,920	--	--	--	3
2,240	1,460	30	--	10	30	710	--	--	--	4
710	--	--	--	--	--	710	--	--	--	5
10	--	--	--	--	--	10	--	--	--	6
32,790	1,630	--	--	--	30	31,130	--	--	--	7
63,930	13,070	110	60	60	340	50,290	1,520	60	1,460	8
5,320	840	--	40	--	110	4,330	--	--	--	9
57,830	13,550	180	220	150	630	43,100	40	10	30	10
60,140	20,840	30	20	50	110	39,090	40	40	--	11
18,820	10,180	--	130	--	40	8,470	10	10	--	12
900	290	--	--	--	--	610	--	--	--	13
36,390	2,600	40	60	140	--	33,550	310	--	310	14
55,780	11,730	240	20	220	330	43,240	4,480	--	4,480	15
16,390	10,100	40	100	--	290	5,860	450	--	450	16
760	340	--	--	--	--	420	--	--	--	17
70,010	18,190	160	60	--	750	50,850	30	30	--	18
47,040	23,880	30	400	--	300	22,430	280	70	210	19
7,560	4,800	--	--	--	--	2,760	--	--	--	20
80	80	--	--	--	--	--	--	--	--	21
2,500	--	--	--	--	--	2,500	--	--	--	22
19,900	180	--	--	--	--	19,720	1,000	--	1,000	23
1,410	--	--	--	--	--	1,410	120	--	120	24
30	--	--	--	--	--	30	--	--	--	25
6,280	240	--	--	--	--	6,040	--	--	--	26
13,070	230	--	--	--	--	12,840	1,010	--	1,010	27
620	--	--	--	--	--	620	--	--	--	28
140	140	--	--	--	--	--	--	--	--	29
600	600	--	--	--	--	--	--	--	--	30
180	180	--	--	--	--	--	--	--	--	31
50	50	--	--	--	--	--	--	--	--	32
6,210	400	--	--	--	--	5,810	--	--	--	33
778,630	277,050	1,450	1,820	1,660	4,140	492,510	10,050	650	9,400	34
UNPRODUCTIVE FOREST LAND										
1,240	--	--	--	--	--	1,240	7,060	--	7,060	35
13,590	1,090	10	--	--	10	12,480	11,440	--	11,440	36
10	--	--	--	--	--	10	--	--	--	37
14,840	1,090	10	--	--	10	13,730	18,500	--	18,500	38
LAND										
438,720	388,410	1,540	580	40	2,020	46,130	840	30	810	39
11,370	4,390	--	--	--	--	6,980	25,290	--	25,290	40
1,000	1,000	--	--	--	--	--	260	--	260	41
451,090	393,800	1,540	580	40	2,020	53,110	26,390	30	26,360	42
LAND										
778,630	277,050	1,450	1,820	1,660	4,140	492,510	--	--	--	43
14,840	1,090	10	--	--	10	13,730	28,550	650	27,900	44
793,470	278,140	1,460	1,820	1,660	4,150	506,240	28,550	650	27,900	45
451,090	393,800	1,540	580	40	2,020	53,110	26,390	30	26,360	46
1,244,560	671,940	3,000	2,400	1,700	6,170	559,350	54,940	680	54,260	47

Table 9.--Area of commercial forest land in Umatilla County, by forest-condition and ownership classes, 1958

(In acres)

Forest-condition class	Total	Private	State	County	Municipal	Federally owned or administered		
						Indian	Bureau of Land Mgt.	National forest
Softwoods:								
Large sawtimber:								
Uncut	159,910	49,970	370	10	20	8,360	1,310	99,870
Residual	39,430	19,780	320	20	--	2,010	210	17,090
Total	199,340	69,750	690	30	20	10,370	1,520	116,960
Small sawtimber:								
Uncut	163,670	44,880	320	--	130	4,600	730	113,010
Residual	62,100	40,150	320	30	--	2,410	260	18,930
Total	225,770	85,030	640	30	130	7,010	990	131,940
Poletimber	114,730	56,000	380	--	20	1,340	720	56,270
Seedlings and saplings	12,610	8,720	70	--	--	30	110	3,680
Hardwoods	3,600	2,170	--	--	20	1,410	--	--
Nonstocked	6,600	1,670	130	--	--	20	--	4,780
Total	562,650	223,340	1,910	60	190	20,180	3,340	313,630

Table 10.--Area of commercial forest land in Union County, by forest-condition and ownership classes, 1958

(In acres)

Forest-condition class	Total	Private	State	County	Federally owned or administered		
					Indian	Bureau of Land Mgt.	National forest
Softwoods:							
Large sawtimber:							
Uncut	200,740	39,470	180	620	890	1,620	157,960
Residual	67,750	28,620	500	90	370	500	37,670
Total	268,490	68,090	680	710	1,260	2,120	195,630
Small sawtimber:							
Uncut	222,620	64,850	320	140	310	680	156,320
Residual	117,770	75,460	180	500	20	300	41,310
Total	340,390	140,310	500	640	330	980	197,630
Poletimber	153,240	64,270	240	430	60	900	87,340
Seedlings and saplings	9,330	3,010	30	40	10	140	6,100
Hardwoods	970	970	--	--	--	--	--
Nonstocked	6,210	400	--	--	--	--	5,810
Total	778,630	277,050	1,450	1,820	1,660	4,140	492,510

Table 11.--Area of young-growth timber stands on commercial forest land in Umatilla County, by stand-size class, species group, and stocking class, 1958[1/]

(In acres)

Stand-size class and species group	Total	Well stocked	Medium stocked	Poorly stocked
Sawtimber:				
Softwoods	225,770	135,200	74,290	16,280
Hardwoods	2,900	1,600	1,080	220
Total	228,670	136,800	75,370	16,500
Poletimber:				
Softwoods	114,730	61,050	34,890	18,790
Hardwoods	430	80	350	--
Total	115,160	61,130	35,240	18,790
Seedlings and saplings:				
Softwoods	12,610	7,570	3,630	1,410
Hardwoods	--	--	--	--
Total	12,610	7,570	3,630	1,410
All classes:				
Softwoods	353,110	203,820	112,810	36,480
Hardwoods	3,330	1,680	1,430	220
Total	356,440	205,500	114,240	36,700

[1/] Young-growth timber stands are those in which the majority of the cubic-foot volume is in trees less than 21.0 inches d.b.h.

Table 12.--Area of young-growth timber stands on commercial forest land in Union County, by stand-size class, species group, and stocking class, 1958[1/]

(In acres)

Stand-size class and species group	Total	Well stocked	Medium stocked	Poorly stocked
Sawtimber:				
Softwoods	340,390	253,130	73,770	13,490
Hardwoods	600	510	20	70
Total	340,990	253,640	73,790	13,560
Poletimber:				
Softwoods	153,240	106,530	33,140	13,570
Hardwoods	180	150	--	30
Total	153,420	106,680	33,140	13,600
Seedlings and saplings:				
Softwoods	9,330	5,580	960	2,790
Hardwoods	50	50	--	--
Total	9,380	5,630	960	2,790
All classes:				
Softwoods	502,960	365,240	107,870	29,850
Hardwoods	830	710	20	100
Total	503,790	365,950	107,890	29,950

[1/] Young-growth timber stands are those in which the majority of the cubic-foot volume is in trees less than 21.0 inches d.b.h.

Table 13.--Net volume of live sawtimber and growing stock on commercial forest land in Umatilla County, by ownership class, 1958

Ownership class	Live sawtimber volume		Growing stock volume
	Scribner rule	International 1/4-inch rule	
	Million bd. ft.	Million bd. ft.	Million cu. ft.
Private	1,291	1,430	394
State	11	12	3
County	(1/)	(1/)	(1/)
Municipal	1	2	(1/)
Federally owned or administered:			
Indian	140	155	41
Bureau of Land Mgt.	20	22	6
National forest	2,834	3,116	845
Total Federal	2,994	3,293	892
All ownerships	4,297	4,737	1,289

1/ Less than 0.5 million.

Table 14.--Net volume of live sawtimber and growing stock on commercial forest land in Union County, by ownership class, 1958

Ownership class	Live sawtimber volume		Growing stock volume
	Scribner rule	International 1/4-inch rule	
	Million bd. ft.	Million bd. ft.	Million cu. ft.
Private	1,287	1,447	488
State	8	9	3
County	10	11	3
Federally owned or administered:			
Indian	9	10	4
Bureau of Land Mgt.	23	26	8
National forest	4,830	5,320	1,387
Total Federal	4,862	5,356	1,399
All ownerships	6,167	6,823	1,893

Table 15.--Net volume of live sawtimber and growing stock on commercial forest land in Umatilla County, by stand-size class, 1958

Stand-size class	Live sawtimber volume		Growing stock volume
	Scribner rule	International 1/4-inch rule	
	Million bd. ft.	Million bd. ft.	Million cu. ft.
Sawtimber stands	4,197	4,622	1,166
Poletimber stands	94	109	120
Seedling and sapling stands	4	4	2
Nonstocked areas	2	2	1
Total	4,297	4,737	1,289

Table 16.--Net volume of live sawtimber and growing stock on commercial forest land in Union County, by stand-size class, 1958

Stand-size class	Live sawtimber volume		Growing stock volume
	Scribner rule	International 1/4-inch rule	
	Million bd. ft.	Million bd. ft.	Million cu. ft.
Sawtimber stands	6,039	6,678	1,736
Poletimber stands	123	140	156
Seedling and sapling stands	4	4	1
Nonstocked areas	1	1	(1/)
Total	6,167	6,823	1,893

1/ Less than 0.5 million.

Table 17.--Net volume of live sawtimber and growing stock on commercial forest land in Umatilla County, by species, 1958

Species	Live sawtimber volume		Growing stock volume
	Scribner rule	International 1/4-inch rule	
	Million bd. ft.	Million bd. ft.	Million cu. ft.
Softwoods:			
Ponderosa pine	1,238	1,359	329
Western white pine	(1/)	(1/)	(1/)
Lodgepole pine	85	99	131
Douglas-fir	1,159	1,293	295
Western larch	460	515	108
White fir	1,069	1,155	336
Subalpine fir	67	73	25
Engelmann spruce	216	240	62
Total	4,294	4,734	1,286
Hardwoods:			
Red alder	--	--	1
Bigleaf maple	--	--	(1/)
Northwestern paper birch	3	3	2
Quaking aspen	--	--	(1/)
Total	3	3	3
All species	4,297	4,737	1,289

1/ Less than 0.5 million.

Table 18.--Net volume of live sawtimber and growing stock on commercial forest land in Union County, by species, 1958

Species	Live sawtimber volume		Growing stock volume
	Scribner rule	International 1/4-inch rule	
	Million bd. ft.	Million bd. ft.	Million cu. ft.
Softwoods:			
Ponderosa pine	1,226	1,362	377
Western white and whitebark pine	8	9	2
Lodgepole pine	257	301	276
Douglas-fir	1,247	1,382	315
Western larch	1,105	1,237	262
White fir	1,551	1,675	425
Subalpine fir	207	224	90
Engelmann spruce	545	610	138
Mountain hemlock	19	21	7
Total	6,165	6,821	1,892
Hardwoods:			
Red alder	--	--	(1/)
Bigleaf maple	--	--	(1/)
Northwestern paper birch	--	--	1
Black cottonwood	2	2	(1/)
Quaking aspen	(1/)	(1/)	(1/)
Total	2	2	1
All species	6,167	6,823	1,893

1/ Less than 0.5 million.

Table 19.--Net volume of live sawtimber on commercial forest land in Umatilla County, by diameter class and species group, 1958

(In million board feet)

Diameter class (inches d.b.h.) and log rule	Total	Ponderosa pine	Douglas-fir	Western larch	White fir	Other
11.0-20.9:						
Scribner rule	1,792	334	553	240	450	215
International 1/4-inch rule	2,041	388	642	279	485	247
21.0-30.9:						
Scribner rule	1,810	682	461	160	398	109
International 1/4-inch rule	1,955	736	498	173	430	118
31.0-40.9:						
Scribner rule	576	193	116	60	160	47
International 1/4-inch rule	614	205	123	63	173	50
41.0 and larger:						
Scribner rule	119	29	29	--	61	--
International 1/4-inch rule	127	30	30	--	67	--
All diameter classes:						
Scribner rule	4,297	1,238	1,159	460	1,069	371
International 1/4-inch rule	4,737	1,359	1,293	515	1,155	415

Table 20.--Net volume of live sawtimber on commercial forest land in Union County, by diameter class and species group, 1958

(In million board feet)

Diameter class (inches d.b.h.) and log rule	Total	Ponderosa pine	Douglas-fir	Western larch	White fir	Other
11.0-20.9:						
Scribner rule	2,886	555	524	591	509	707
International 1/4-inch rule	3,296	644	608	685	550	809
21.0-30.9:						
Scribner rule	2,118	394	490	363	586	285
International 1/4-inch rule	2,287	425	528	392	633	309
31.0-40.9:						
Scribner rule	862	231	154	113	318	46
International 1/4-inch rule	921	245	164	120	343	49
41.0 and larger:						
Scribner rule	301	46	79	38	138	--
International 1/4-inch rule	319	48	82	40	149	--
All diameter classes:						
Scribner rule	6,167	1,226	1,247	1,105	1,551	1,038
International 1/4-inch rule	6,823	1,362	1,382	1,237	1,675	1,167

Table 21.--Net volume of all timber on commercial forest land in Umatilla County, by class of material and species group, 1958

(In million cubic feet)

Class of material	Total	Softwoods	Hardwoods
Growing stock:			
Sawtimber trees:			
Saw-log portion	918	917	1
Upper-stem portion	69	69	(1/)
Total	987	986	1
Poletimber trees	302	300	2
Total growing stock	1,289	1,286	3
Other material:			
Sound cull trees	9	5	4
Rotten cull trees	2	2	(1/)
Salvable dead trees	8	8	--
Total other material	19	15	4
All timber	1,308	1,301	7

1/ Less than 0.5 million.

Table 22.--Net volume of all timber on commercial forest land in Union County, by class of material and species group, 1958

(In million cubic feet)

Class of material	Total	Softwoods	Hardwoods
Growing stock:			
Sawtimber trees:			
Saw-log portion	1,265	1,265	(1/)
Upper-stem portion	95	95	(1/)
Total	1,360	1,360	(1/)
Poletimber trees	533	532	1
Total growing stock	1,893	1,892	1
Other material:			
Sound cull trees	8	7	1
Rotten cull trees	3	3	(1/)
Salvable dead trees	10	10	--
Total other material	21	20	1
All timber	1,914	1,912	2

1/ Less than 0.5 million.

Table 23.--Average annual cut of live sawtimber and growing stock on commercial forest land in Umatilla and Union Counties, by species group, 1954-58

Species group[1]	Live sawtimber						Growing stock		
	Scribner rule			International 1/4-inch rule					
	Annual cut[2]	Timber products	Logging residue	Annual cut[2]	Timber products	Logging residue	Annual cut[2]	Timber products	Logging residue
	Thousand board feet						Thousand cubic feet		
Softwoods									
Umatilla	84,188	86,613	1,698	92,775	95,448	1,871	18,794	17,764	1,030
Union	83,859	86,275	1,691	92,748	95,420	1,870	19,497	18,428	1,069
Total	168,047	172,888	3,389	185,523	190,868	3,741	38,291	36,192	2,099

[1] Hardwood cut insignificant.

[2] Annual cut is the reduction in inventory volume resulting from the production of the given output of timber products.

FOREST SURVEY PROCEDURE

Procedures used in the reinventory of Umatilla and Union Counties were materially different from those used in the initial inventory. This change in procedures accounts for some significant differences in the forest-area and timber-volume statistics obtained.

Initial Inventory

The initial inventory of the counties' forests was conducted in 1936 by what is known as the "compilation method." In this method, existing information on forest types, timber volumes, areas logged, and other inventory data were collected from private timber owners and various public agencies. These data were checked in the field for reliability and were adjusted to Forest Survey specifications and standards. Forest-type and timber-volume data for areas not covered by reliable existing information were obtained through field reconnaissance. Timber-volume estimates for immature stands were determined from normal yield tables adjusted for site, age, and density of stand.

All land in the counties was classified as either forest or nonforest. Forest land was further classified as commercial or noncommercial; the commercial was still further classified by forest type, stand-size or condition class, and--in the case of young-growth stands--by stocking and age classes. All such types and classes were mapped in place on a 1-inch-to-the-mile base map of each forested township. Next, these township type maps were superimposed over current ownership-status plats and dot counted to obtain forest-type area statistics by ownership class. Type delineations on the township maps were then transferred to a base map of each county to form a county forest type map. The commercial forest land was also classified as to site quality, or forest productive capacity.

In-place, timber-volume estimates were based on (1) existing cruises collected and adjusted to the Forest Survey standard, (2) field samples, and (3) ocular appraisals. Cruises made by commercial cruisers were obtained for most of the privately owned timber, and Forest Service cruises were available for a large part of the national-forest lands. Separate volume estimates were computed for each of the commercial tree species and for each ownership class. Methods used in this initial inventory did not permit a statistical computation of accuracy of the estimate.

Reinventory

In the reinventory in 1957-58, the forest type maps of both counties were completely revised. This revision was accomplished through interpretation, classification, and field mapping on aerial photos that covered all the land area in the two counties. In mapping on aerial photos, types whose classification was difficult were examined more closely in the field.

Likewise, species composition of mixed stands was checked on the ground. The use of aerial photos in mapping resulted in type delineations of much greater accuracy and detail than was possible through the ground reconnaissance employed in the initial inventory. In the preparation of a revised type map, the delineations on the aerial photos were transferred to a 2-inch county base map through use of a reflecting projector.

Volume estimates for live sawtimber, growing stock, and salvable dead material were derived through a sampling procedure in which stands were measured on sample plots. A sample plot consisted of a cluster of three 1/5-acre circular subplots spaced at 6-chain intervals. Intensity of sampling was designed to produce an estimate of total volume to a specified sampling accuracy set by Forest Survey.

For those areas outside the national forests, and for the Union and Elkhorn Working Circles of the Wallowa-Whitman National Forests, type areas were determined by a dot count on the forest type map. The average per-acre volumes for sawtimber, poletimber, and seedling and sapling stands were obtained through a sampling procedure in which stands were sampled with a systematic grid of plots evenly distributed over each county. This was slightly modified in the Union and Elkhorn Working Circles, where the plots were selected randomly. Volume estimates were calculated by applying average per-acre volumes to the appropriate forest type areas.

A different procedure was used for the remainder of the national-forest area. Land classification for the North Fork, Grande Ronde, and Wenaha Working Circles of the Umatilla National Forest was based on a systematic grid of plots. Each subplot was first classified as commercial forest, noncommercial forest, or nonforest. The ratio of subplots in each class to the total number of subplots was applied to the total land area to determine the acreage of each classification. Subplots falling on commercial forest land were also classified by forest type and stand-size class as indicated by the plot tally. The percentage of subplots falling in each type was applied to the total area of commercial forest land in the working circle to determine the acreage of land in that type.

Volumes were determined in the following manner: For each working circle, an average volume per acre was determined by species for all the subplots falling on commercial forest land. These volumes, expanded by the total acreage of commercial forest land in each working circle, provided total volume by species for each working circle inventoried.

ACCURACY OF 1957-58 REINVENTORY DATA

Forest Area

With the exception of three national-forest working circles, acreages of forest type, stand-size class, and condition class were obtained

from forest type maps of the two counties. Thus no error due to sampling was involved in most of the two-county area. Errors due to techniques or judgment in the field were possible but difficult to evaluate. Throughout all phases of the work, however, close supervision and frequent checks assured a high level of accuracy and uniformity of standards.

The North Fork, Wenaha, and Grande Ronde Working Circles of the Umatilla National Forest were sampled for area. The chances are 19 out of 20 that the actual total area of commercial forest land in the Umatilla County parts of these three working circles is within plus or minus 4.8 percent of the estimated total of 313,631 acres, and that the noncommercial area is within plus or minus 57.0 percent of the estimated 17,195 acres. On the same basis, the area of commercial forest land in the Union County parts of the three working circles is within plus or minus 2.0 percent of the estimated total of 342,196 acres, and the noncommercial area is within plus or minus 112.6 percent of the estimated total of 6,082 acres.

Timber Volume

The chances are 19 out of 20 that the total board-foot volume of live sawtimber, if measured by a 100-percent cruise, would be within plus or minus 24.8 percent of the estimated total of 4,297 million board feet (Scribner rule) for Umatilla County and within plus or minus 8.8 percent of the estimated total of 6,167 million board feet for Union County. On the same basis, cubic-foot volume of growing stock from a 100-percent cruise would be within a range of plus or minus 11.0 percent of the estimated 1,289 million cubic feet for Umatilla County and 6.3 percent of the estimated 1,893 million cubic feet for Union County.

DIFFERENCES IN RESULTS OF INVENTORIES

Some of the differences between forest-type and timber-volume statistics resulting from the initial inventory and those resulting from the reinventory are due to physical change--such as cutting of stands, restocking of deforested areas, and ingrowth of stands into the next larger size class. Other differences are due to variations in the procedures used to interpret and classify forest conditions, and to variations in standards of utilization. Differences such as these preclude direct comparison of some of the statistics; comparison of other statistics is meaningful only after they have been adjusted to common standards.

Forest Area

Standards of merchantability and sampling techniques changed too extensively in the 1937-58 period to make area comparisons meaningful. The reclassification of barren areas at timberline, formerly classified as noncommercial forest land, to nonforest land probably contributed to the decrease in forest land area in Union County. Forest growth and changes

in merchantability standards may have contributed to the sharp increase in sawtimber acreage and the corresponding decrease in poletimber area in Union County. How many, if any, of these differences represent real changes is impossible to determine.

Table 24.--Comparison of forest area statistics for Umatilla and Union Counties, initial inventory and reinventory

(Thousand acres)

Forest area	Both counties		Umatilla		Union	
	1936	1958	1936	1958	1936	1958
Sawtimber	812	1,049	413	432	399	617
Poletimber; seedlings and saplings	542	294	139	128	403	166
Nonstocked	3	13	1	7	2	6
Noncommercial unproductive	89	55	16	22	73	33
Total	1,446	1,411	569	589	877	822

Timber Volume

Some differences in volume estimates between 1936 and 1958 are due to differences in survey techniques, procedures, and methods. The effect of these differences on volume estimates cannot be adequately measured. The 1958 volume estimate has a calculated sampling error (page 35); however, no statistical evaluation of the 1936 estimates can be made.

Changes in utilization standards also contributed to volume differences. Changes included lowering the merchantable top diameter of sawtimber trees and reducing the minimum requirement of net volume in a merchantable sawtimber tree. In 1958, improved volume tables were used that gave a materially greater volume for a tree of a given size than did the tables used in the 1936 inventories. The large increase in the volumes of all conifer species other than ponderosa pine is probably at least partly a result of the increased economic importance of these species and the corresponding changes in utilization standards, particularly with regard to reduction of estimates of cull.

Table 25.--Comparison of timber volume statistics for Umatilla and Union Counties, initial inventory and reinventory

(Million board feet, Scribner rule)

Species	Both counties		Umatilla		Union	
	1936	1958	1936	1958	1936	1958
Ponderosa pine	2,581	2,464	1,547	1,238	1,034	1,226
Douglas-fir	1,213	2,406	556	1,159	657	1,247
Western larch	1,081	1,565	351	460	730	1,105
White fir	887	2,620	445	1,069	442	1,551
Other softwoods	341	1,404	131	368	210	1,036
Hardwoods	7	5	6	3	1	2
Total	6,110	10,464	3,036	4,297	3,074	6,167

DEFINITION OF TERMS

Land Area

Total Land Area

Includes dry land and unmeandered water surfaces.

Forest Land Area

Includes (a) land that is at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; and (b) land from which the trees described in "(a)" have been removed to less than 10-percent stocking and that has not been developed for other use.

Nonforest Land Area

Land that does not qualify as forest land.

Forest Land Classes

Commercial Forest Land Area

Forest land that is (a) producing, or physically capable of producing, usable crops of wood, usually sawtimber, (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial Forest Land Area

Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Types

Forest Land Types

Forest land is typed on the basis of the predominant species, as indicated by cubic volume for sawtimber and poletimber stands and number of trees for seedling and sapling stands, or on the basis of forest condition, such as nonstocked cutover or burned-over land. Where none of the indicated species comprise 50 percent or more of a given stand, the stand is classified on the basis of plurality of cubic volume or number of trees.

Commercial Forest Land

Major forest types. Local forest types are grouped into generalized types. The major forest types in Umatilla and Union Counties are as follows:

Ponderosa pine. Forests in which 50 percent or more of the stand is ponderosa pine.

Lodgepole pine. Forests in which 50 percent or more of the stand is lodgepole pine.

Douglas-fir. Forests in which 50 percent or more of the stand is Douglas-fir.

Western larch. Forests in which 50 percent or more of the stand is western larch.

Fir-spruce. Forests in which 50 percent or more of the stand is true fir, Engelmann spruce, or both.

Hardwoods. Forests in which 50 percent or more of the stand is black cottonwood, or other hardwoods, singly or in combination.

Noncommercial Forest Land

Productive-reserved. Forest land withdrawn from timber utilization through statute, ordinance, or administrative order, but which otherwise qualifies as commercial forest land.

Unproductive. Forest land incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Nonforest Land Types

Vegetative. Cultivated land, stump pasture, grass or brush on nonforest land.

Nonvegetative. Includes barrens and towns.

Unmeandered water. Includes unmeandered streams and lakes, and tideflats.

Tree Classes

Sawtimber Tree

Tree of commercial species, 11.0 inches d.b.h. and larger, that contains at least one 16-foot coniferous saw log or one 8-foot hardwood saw log to a variable top diameter never less than 8 inches inside the bark. Also, 25 percent or more of the gross board-foot volume must be free from rot or defect.

Poletimber Tree

Tree of commercial species, 5.0 to 10.9 inches d.b.h., in which 25 percent or more of the gross cubic-foot volume is free from rot and defect.

Seedling and Sapling Trees

Live trees of commercial species, less than 5.0 inches d.b.h., and of good form and vigor.

Cull Tree

Live tree of sawtimber or poletimber size that is unmerchantable for saw logs, now or prospectively, because of defect, rot, or species.

Sound cull tree. Live tree of sawtimber or poletimber size that contains 25 percent or more of sound volume but will not make at least one merchantable saw log, now or prospectively, because of roughness, poor form, or species.

Rotten cull tree. Live tree of sawtimber or poletimber size in which less than 25 percent of the total volume is sound.

Salvable Dead Tree

Standing or down dead tree that contains 25 percent or more of sound volume and at least one merchantable 16-foot coniferous or 8-foot hardwood saw log.

Stand-Size Classes

Sawtimber Stand

Stand of sawtimber trees having a minimum per-acre net volume (International 1/4-inch rule) of 1,500 board feet.

Large sawtimber stand. Stand in which the majority of the volume is in trees 21.0 inches d.b.h. and larger.

Small sawtimber stand. Stand in which the majority of the volume is in trees from 11.0 to 20.9 inches d.b.h.

Uncut sawtimber stand. Uncut sawtimber stand or sawtimber stand in which less than 10 percent of its volume has been removed by cutting.

Residual sawtimber stand. Sawtimber stand in which 10 percent or more of the volume has been removed by cutting, and in which the residual per-acre volume (International 1/4-inch rule) amounts to 1,500 board feet.

Poletimber Stand

Stand failing to meet sawtimber stand specifications but at least 10 percent stocked with poletimber and larger (5.0 inches d.b.h. and larger) trees and with at least half the minimum stocking in poletimber trees.

Seedling and Sapling Stand

Stand not qualifying as either a sawtimber or poletimber stand but at least 10 percent stocked with trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

Nonstocked Area

An area less than 10 percent stocked with present or potential growing-stock trees.

Stocking

Stocking is the extent to which growing space is effectively utilized by present or potential growing-stock trees of commercial species. "Degree of stocking" is synonymous with "percent of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Stocking may be measured in terms of number of trees, volume, basal area, cover canopy, or other criterion or combination of criteria.

Well-stocked stand. Stand that is 70 percent or more stocked with present or potential growing-stock trees.

Medium-stocked stand. Stand that is 40 to 69 percent stocked with present or potential growing-stock trees.

Poorly stocked stand. Stand that is 10 to 39 percent stocked with present or potential growing-stock trees.

Nonstocked area. An area less than 10 percent stocked with present or potential growing-stock trees.

Timber Volume

Live Sawtimber Volume

Net volume in board feet of live sawtimber trees of commercial species:

Scribner rule. The common board-foot log rule used in determining volume of sawtimber in the Pacific Northwest.

International 1/4-inch rule. The standard board-foot log rule adopted nationally by the Forest Service in the presentation of Forest Survey volume statistics.

Growing Stock

Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

All-Timber Volume

Net volume in cubic feet of live and salvable dead sawtimber trees and poletimber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark.

Timber Cut

Annual Cut of Live Sawtimber

The net board-foot volume of live sawtimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from live sawtimber. The volume of timber products cut from live sawtimber.

Logging residues from live sawtimber. The volume of sound wood in live sawtimber trees cut or killed by logging on commercial forest land and not converted to timber products.

Annual Cut of Growing Stock

The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging on commercial forest land during a specified year.

Timber products from growing stock. The volume of timber products cut from growing stock.

Logging residues from growing stock. The volume of sound wood in growing stock cut or killed by logging on commercial forest land and not converted to timber products.

TREE SPECIES

Tree species commonly found in Umatilla and Union Counties include:

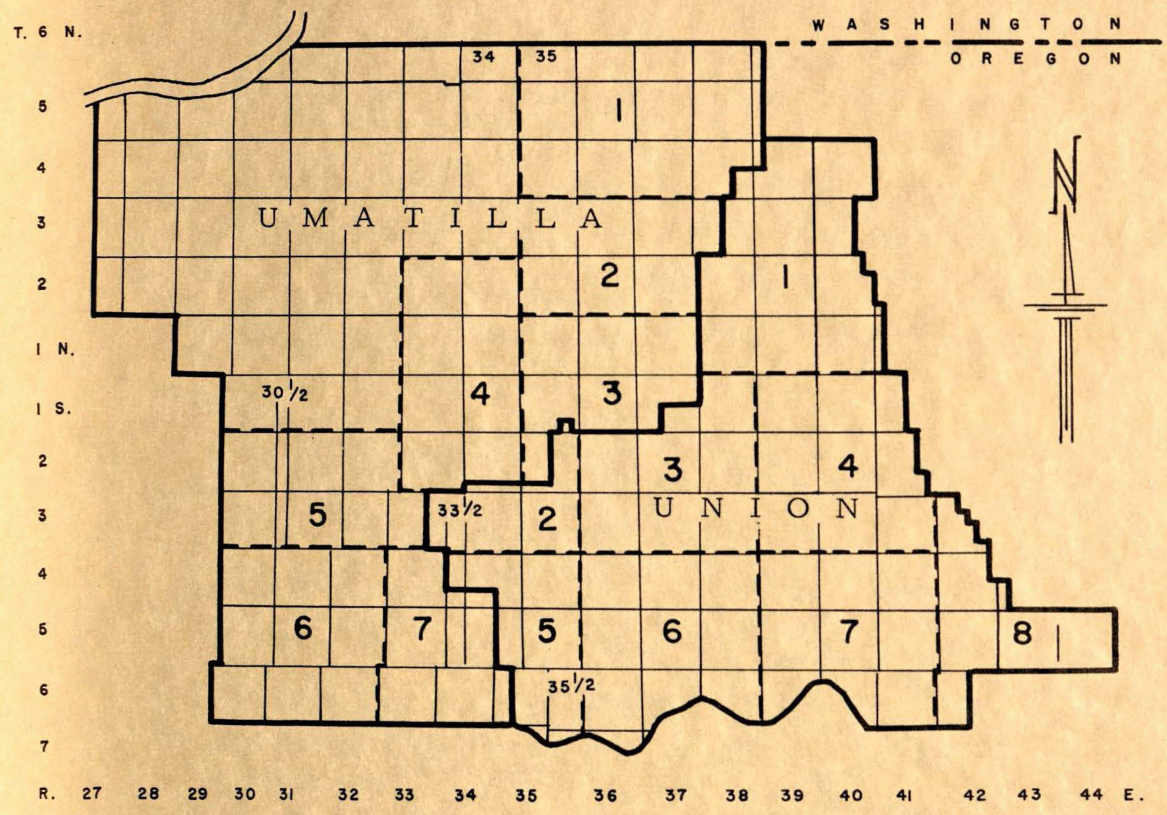
Softwoods:

- Ponderosa pine (*Pinus ponderosa*)
- Lodgepole pine (*Pinus contorta*)
- Douglas-fir (*Pseudotsuga menziesii*)
- White fir (*Abies concolor* or *A. grandis*)[1/]
- Subalpine fir (*Abies lasiocarpa*)
- Western larch (*Larix occidentalis*)
- Engelmann spruce (*Picea engelmannii*)
- Western juniper (*Juniperus occidentalis*)
- Mountain hemlock (*Tsuga mertensiana*)
- Whitebark pine (*Pinus albicaulis*)
- Western white pine (*Pinus monticola*)

Hardwoods:

- Black cottonwood (*Populus trichocarpa*)
- Quaking aspen (*Populus tremuloides*)
- Northwestern paper birch (*Betula papyrifera* var. *subcordata*)
- Red alder (*Alnus rubra*)
- Bigleaf maple (*Acer macrophyllum*)

[1/] No attempt was made to separate *A. concolor* (white fir) from *A. grandis* (grand fir). White fir, as specified in the Forest Survey in the Pacific Northwest, may be *concolor*, *grandis*, or both.



INDEX MAP of

UMATILLA and UNION COUNTIES,

STATE of OREGON

showing divisions of 2" = 1 mile maps